

## 14\_31 Relationship btwn Side Slope and Shape Cluster

### Question:

The scope of my TIP Project requires widening of an existing Interstate facility inside toward the median. The Project is currently under functional/preliminary design phase and I am using Template Configuration 2 to get a rough estimate of the proposed template. I am having a difficult time processing Criteria for the required scope of work and when some preliminary template are finally drawn, multiple subgrade lines and other elements are also drawn in the vicinity. How can I use the proposed template correctly to cut cross section of the desired proposed template and reduce time spent hand modification and deleting undesired elements on these cross sections?

### Answer:

#### Template Configuration 2

Cross sections are drawn using the superelevation rate of the Geopak shape. The width of the proposed road is derived from the existing edge of pavement (BOP) to the edge of the Geopak shape. The elevation is obtained from the existing ground line plus the resurfacing depth. Since Criteria **requires** a Geopak shape with a profile even though the profile is disregarded with Template configuration 2, a dummy profile or the existing ground profile can be used.

By including extra, and not needed, Criteria files in the input, multiple subgrade lines and other elements are drawn on the proposed template. If all the proposed work is being confined just in the vicinity of the median, then include only pertinent Criteria files on the median side slope side of the shape cluster in the Criteria input file. First, one must understand the relationship between side slope and shape cluster before determining which Criteria files to include as part of the input.

Below is a general sketch of side slope left and right sides of a shape cluster. Note for a divided facility, there is a left shape cluster and a right (plus) shape cluster because of their relationship to the PGL or Tie offset distance. Each shape cluster has a left and right side slope sides.



Below is a typical representation for an undivided facility of the shape cluster and the side slope sides in a Criteria input.

```
CRITERIA FOR SHAPE CLUSTER
SHAPE CLUSTER BASELINE = L
SHAPE CLUSTER PROFILE = L
SHAPE CLUSTER TIE = 0
```

```
SIDE SLOPE LT
include L:\tmplt01.cri
include L:\shld01.cri
include L:\dss01.cri
```

```
SIDE SLOPE RT
include L:\tmplt01.cri
include L:\shld01.cri
include L:\dss01.cri
```

Compare the above with a typical representation for a divided facility of the shape clusters and the side slope sides in a Criteria input.

```
CRITERIA FOR SHAPE CLUSTER
SHAPE CLUSTER BASELINE = L
SHAPE CLUSTER PROFILE = L
SHAPE CLUSTER TIE = -30
```

```
SIDE SLOPE LT
include L:\tmplt01.cri
include L:\shld01.cri
include L:\dss01.cri
```

```

SIDE SLOPE RT
include L:\tmp01.cri
include L:\shd02.cri
include L:\mdnd01.cri

```

```

CRITERIA FOR SHAPE CLUSTER
SHAPE CLUSTER BASELINE = L
SHAPE CLUSTER PROFILE = L
SHAPE CLUSTER TIE = 30

```

```

SIDE SLOPE LT
include L:\tmp01.cri
include L:\shd02.cri
include L:\mdnd01.cri

```

```

SIDE SLOPE RT
include L:\tmp01.cri
include L:\shd01.cri
include L:\vss01.cri

```

Applying our understanding of the relationship between side slope and shape cluster, include only the pertinent Criteria files on the median side slope side of each shape cluster.

```

CRITERIA FOR SHAPE CLUSTER
SHAPE CLUSTER BASELINE = Y
SHAPE CLUSTER PROFILE = EX_Y
SHAPE CLUSTER TIE = -34
SIDE SLOPE RT where (station >=29+50) and (station <=47+50)
include L:\tmp01.cri
include L:\shd02.cri
include L:\mdnd01.cri

```

Right Side for Minus Shape Cluster

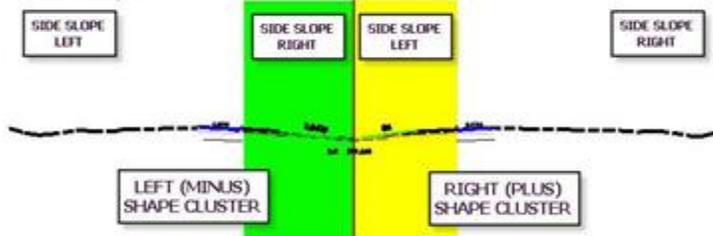
```

CRITERIA FOR SHAPE CLUSTER
SHAPE CLUSTER BASELINE = Y
SHAPE CLUSTER PROFILE = EX_Y
SHAPE CLUSTER TIE = 34
SIDE SLOPE LT where (station >=29+50) and (station <=47+50)
include L:\tmp01.cri
include L:\shd02.cri
include L:\mdnd01.cri

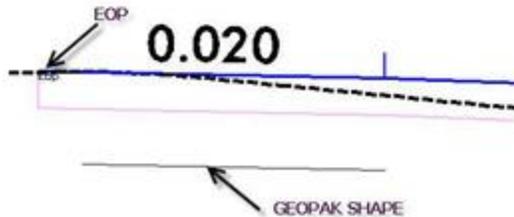
```

Left Side for Plus Shape Cluster

Criteria will only draw in the median.



Note the effect of widening Template Configuration 2 with respect to the Geopak shape and EOP.



Also note, for raised concrete islands, a combination of undivided and divided shape cluster definitions is required. Since the PGL or grade point is located on the centerline (baseline), the Tie is 0. There is also a gap (or median according to Geopak shape definition) between shapes, which requires the designation of either a minus or plus shape cluster side definition. To properly define a raised concrete island Criteria with a *projected* grade from the centerline, define the shape cluster as such.

CRITERIA FOR SHAPE CLUSTER  
SHAPE CLUSTER BASELINE = L  
SHAPE CLUSTER PROFILE = L  
SHAPE CLUSTER TIE = 0  
SHAPE CLUSTER OFFSET = MINUS

SIDE SLOPE LT  
include ...

SIDE SLOPE RT  
include ...

CRITERIA FOR SHAPE CLUSTER  
SHAPE CLUSTER BASELINE = L  
SHAPE CLUSTER PROFILE = L  
SHAPE CLUSTER TIE = 0  
SHAPE CLUSTER OFFSET = PLUS

SIDE SLOPE LT  
include ...

SIDE SLOPE RT  
include ...

Below is a sketch describing how the grade is projected from the centerline for raised concrete islands.

